

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 84524
CSAH NO. 32
OVER THE
BUFFALO RIVER
DISTRICT 4 - WILKIN COUNTY



PREPARED FOR THE
MINNESOTA DEPARTMENT OF TRANSPORTATION
BY
COLLINS ENGINEERS, INC.
JOB NO. 5221

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected below water at Bridge No. 84524, Piers 1 and 2, were found to be in good condition with no defects of structural significance at this time. The piles exhibited coating failure, from the channel bottom to 3 feet up, with minor surface corrosion.

A large scour depression was observed around Pier 2, but overall the channel bottom around the substructure units appeared stable.

INSPECTION FINDINGS:

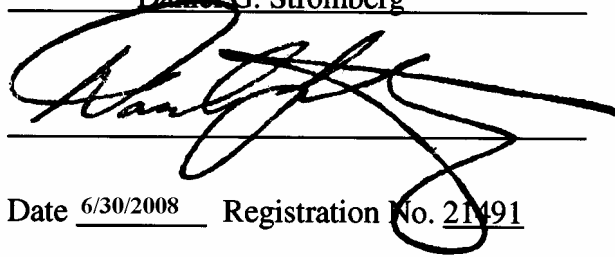
- (A) Piers 1 and 2 exhibited coating loss from the channel bottom to 3 feet above the channel bottom. The exposed steel exhibited minor surface corrosion with no appreciable loss of section.
- (B) A 10 foot long by 5 foot wide by 1 foot deep scour depression was observed around the two upstream piles of Pier 2.

RECOMMENDATIONS:

- (A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

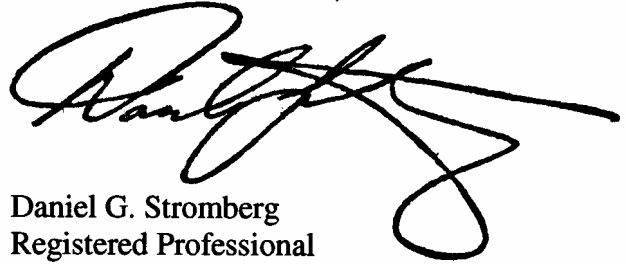
Daniel G. Stromberg

A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over two horizontal lines.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 84524

Feature Crossed: The Buffalo River

Feature Carried: CSAH No. 32

Location: District 4 – Wilkin County

Bridge Description: The superstructure consists of a three span reinforced concrete slab. The superstructure is supported by two reinforced concrete abutments and two steel pipe pile piers. The piers are numbered 1 and 2 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Bradley A. Syler, P.E, S.E.

Dive Team: John Loftus, Valerie Roustan

Date: August 21, 2007

Weather Conditions: Cloudy, $\pm 70^{\circ}\text{F}$

Underwater Visibility: ± 1 Foot

Waterway Velocity: ± 0.5 fps

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: Piers 1 and 2 consist of a single line of six steel pipe piles supporting a reinforced concrete cap. Each abutment is a closed-type abutment.

Maximum Water Depth at Substructure Inspected: Approximately 1.0 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the south end of Pier 1.

Water Surface: The waterline was approximately 10.1 feet below reference.
Assumed Waterline Elevation = 89.9.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 8

Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code F/02

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

 Yes X No



Photograph 1. Overall View of the Structure, Looking Southwest.



Photograph 2. View of the West Abutment, Looking Northwest.



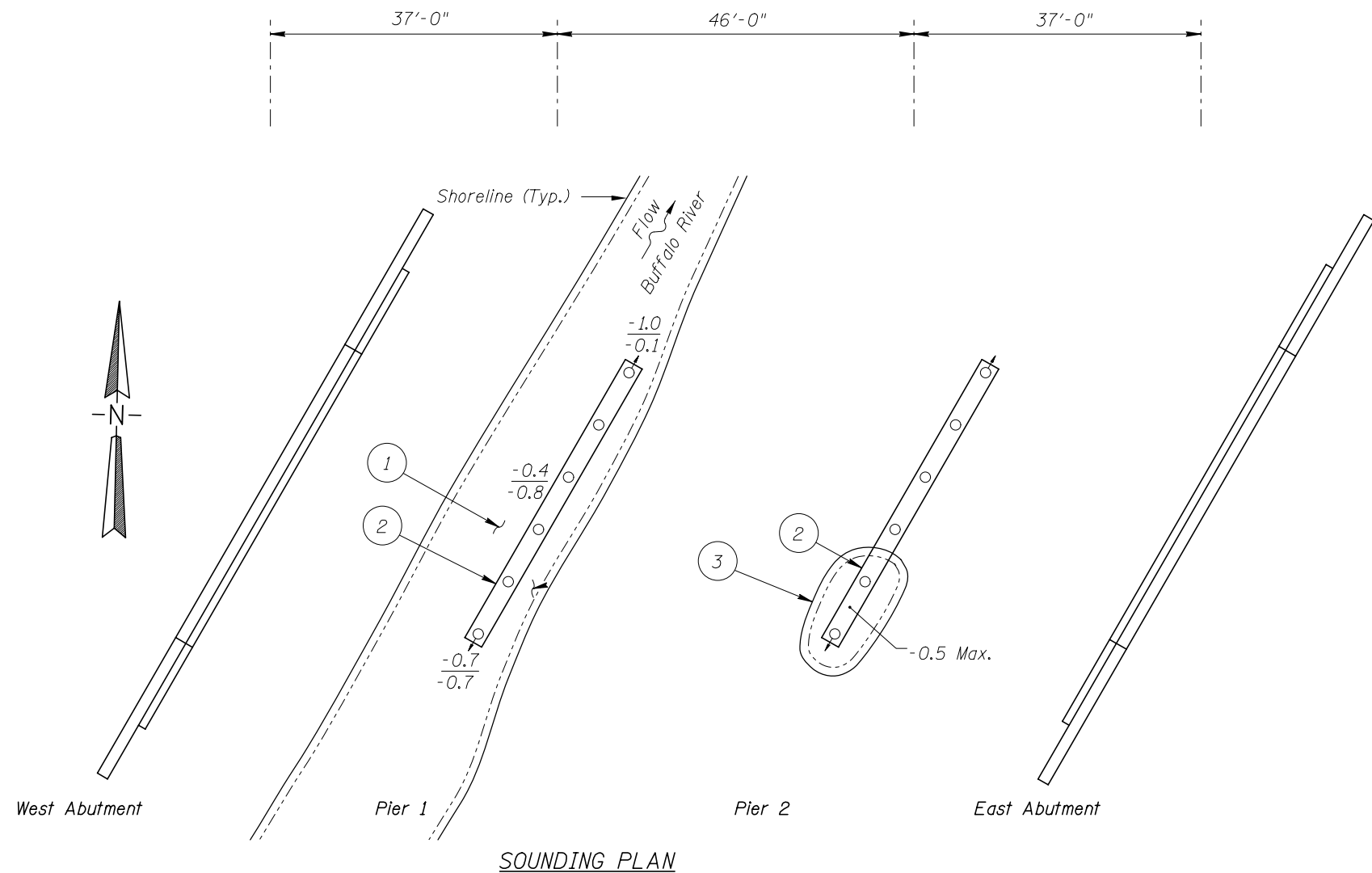
Photograph 3. View of Pier 1, Looking Northeast.



Photograph 4. View of Pier 2, Looking Southwest.



Photograph 5. View of East Abutment, Looking Southeast.

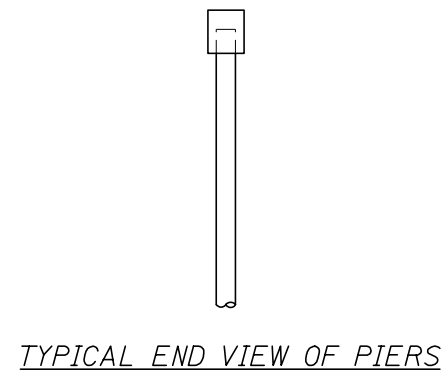


GENERAL NOTES:

- Piers 1 was inspected underwater. Pier 2 (in the dry at the time of this inspection) may also be submerged and was inspected.
- At the time of inspection on August 21, 2007, the waterline was located approximately 10.1 feet below the top of the pile cap at the upstream end of Pier 1. Since insufficient bridge elevation information was available, a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 89.9.
- Soundings indicate the water depth at the time of inspection and are measured in feet.
- Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

- The channel bottom around both piers consisted of soft silt, sand, and random stones with up to 18 inch diameter with up to 2 feet of probe rod penetration.
- Piers 1 and 2 exhibited coating loss from channel bottom to 3 feet above the channel bottom. The exposed steel exhibited minor surface corrosion with no appreciable loss of section.
- A 10 feet long (N/S) by 5 feet wide (E/W) by 1 foot deep scour depression was observed around the two upstream piles of Pier 2.



Legend

- 5.2 Sounding Depth (8/21/07)
-5.2 Sounding Depth (10/29/02)
- Cast-in-place Concrete Pile (Shell Pile)
⬆ Battered Cast-in-place Concrete Pile (Shell Pile)

Note:

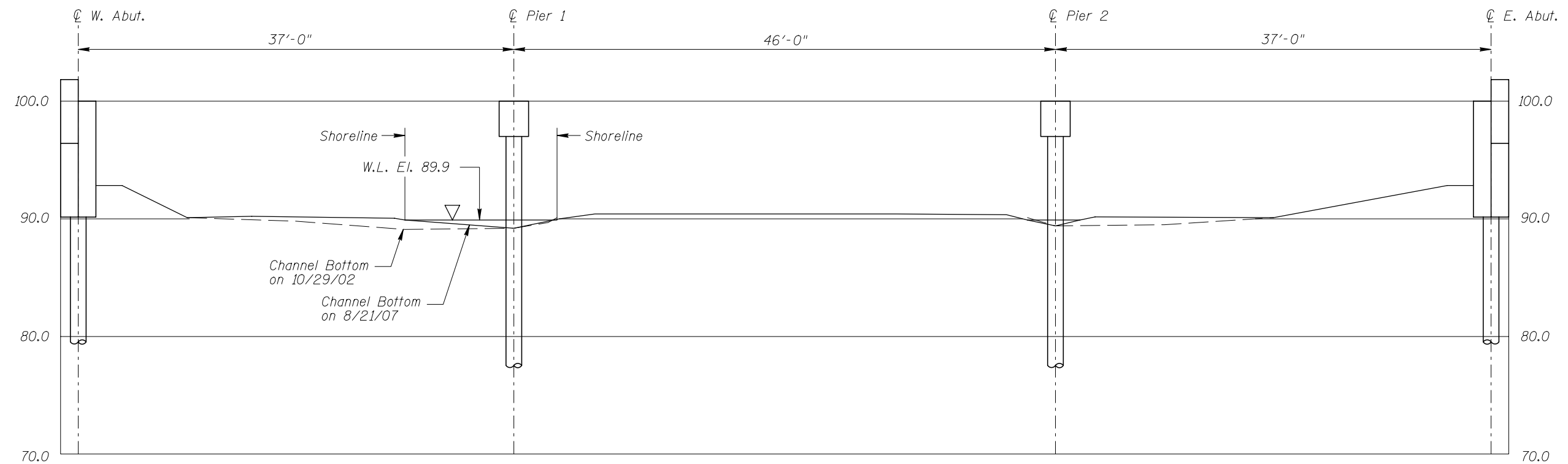
All soundings based on 2007 waterline location.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION

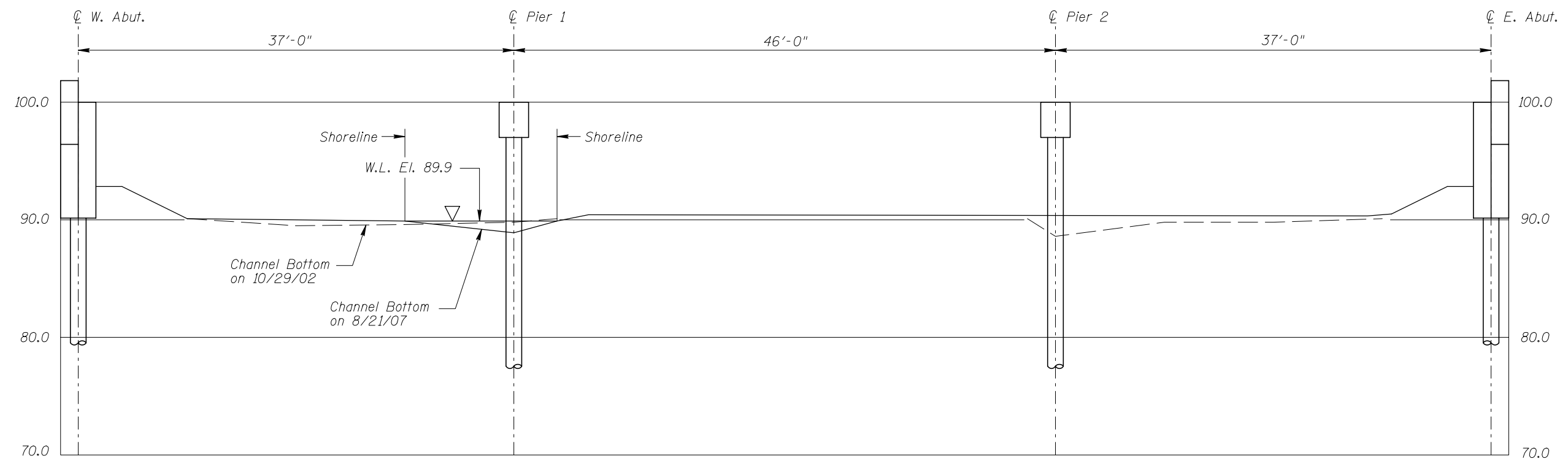
STRUCTURE NO. 84524
OVER THE BUFFALO RIVER
DISTRICT 4, WILKIN COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: OCT, 2007
Checked By: MDK		Scale: NTS
Code: 522184524		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

**MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION**

STRUCTURE NO. 84524
OVER THE BUFFALO RIVER
DISTRICT 4, WILKIN COUNTY
**UPSTREAM AND DOWNSTREAM
FASCIA PROFILES**

Drawn By: PRH	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCT, 2007
Checked By: MDK		Scale: 1"=10'
Code: 522184524		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 21, 2007

ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E.

BRIDGE NO: 84524 WEATHER: Cloudy, $\pm 70^{\circ}\text{F}$

WATERWAY CROSSED: The Buffalo River

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: John Loftus, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Scraper, Lead Line, Sounding Pole, Probe Rod, Camera

TIME IN WATER: 10:20 A.M.

TIME OUT OF WATER: 10:35 A.M.

WATERWAY DATA: VELOCITY ± 0.5 foot

VISIBILITY ± 1 foot

DEPTH 1.0 foot maximum at Pier 1

ELEMENTS INSPECTED: Piers 1 and 2.

REMARKS: Overall, the submerged steel of the piles was in good condition exhibiting coating failure from the channel bottom to 3 feet above. The exposed steel exhibited minor surface corrosion with no appreciable loss of section. A 10 foot long by 5 foot wide by 1 foot deep scour depression was observed around the two upstream piles of Pier 2. Otherwise, the channel bottom appeared stable with no notable defects.

FURTHER ACTION NEEDED: YES X NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 84524
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.
WATERWAY CROSSED The Buffalo River

INSPECTION DATE August 21, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	1.0'	8	N	N	9	N	8	7	8	N	N	8	N	8	N	N	N	N
	Pier 2	0.5'	8	N	N	9	N	8	6	8	N	N	7	N	8	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the submerged steel of the piles was in good condition exhibiting coating failure from the channel bottom to 3 feet above. The exposed steel exhibited minor surface corrosion with no appreciable loss of section. A 10 foot long by 5 foot wide by 1 foot deep scour depression was observed around the two upstream piles of Pier 2. Otherwise, the channel bottom appeared stable with no notable defects.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO. USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.